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The Perceived Gayness of PrEP: The Influence of Masculinity Ideology on Black Men Who have Sex with Men's Interest in PrEP

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The Perceived Gayness of PrEP: The Influence of Masculinity Ideology on Black Men Who Have Sex with Men's Interest in PrEP

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Abstract

Black men who have sex with men (BMSM) experience higher HIV incidence rates than any other U.S. population subgroup. The development of a bio-behavioral strategy using anti-retroviral therapy, pre-exposure prophylaxis (PrEP), provides a new alternative for HIV prevention; however, interest and uptake among BMSM remains poor. Gender-based perceptions and roles may be a factor in PrEP interest among BMSM. The present study examined the relationship between avoidance of femininity, heterosexual self-presentation, PrEP stigma and PrEP interest among BMSM. A self-administered questionnaire assessing aspects of traditional masculinity ideology, stigmatized beliefs that PrEP use will out one as gay, and PrEP interest was completed by BMSM attending the 2017 Atlanta Black gay pride festival. Conditional process modeling tested moderated mediation among PrEP stigma, avoidance of femininity, and heterosexual self-presentation. Results partially supported the hypothesized model; the expected direct relationship was observed between avoidance of femininity and interest in PrEP, however, conformity to heterosexual self-presentation produced inconsistent mediation. Further, moderation by PrEP stigma produced contrary findings while controlling for age, openness of sexual orientation, and frequency of previous HIV testing. The present study demonstrates that traditional masculinity ideology and stigmatized beliefs regarding PrEP play a role in PrEP interest among BMSM, and that PrEP may be viewed by some as a means of being "outed" regarding their sexual orientation. Future interventions designed to increase uptake of PrEP in BMSM should be attentive to the role of these contextual psychosocial factors.

Key words: Black men who have sex with men, pre-exposure prophylaxis, HIV, masculinity ideology, stigma

The Perceived Gayness of PrEP: The influence of Masculinity Ideology on Black Men Who Have Sex with Men's Interest in PrEP

HIV incidence rates among Black men who have sex with men (BMSM) are higher than any other U.S. population subgroup. BMSM make up 58% of the Black population living with HIV, and the CDC estimates that half of BMSM in the U.S. will become infected with HIV if current incidence rates continue (CDC, 2016a). Advances in HIV prevention have produced a bio-behavioral strategy effective in reducing HIV incidence, pre-exposure prophylaxis (PrEP), which relies on HIV negative persons taking antiretroviral therapy (ART). PrEP substantially reduces HIV transmission to nearly complete protection when taken daily (Baeten et al., 2012; Grant et al., 2010). However, interest and uptake of PrEP has varied among MSM, with poor uptake seen among BMSM (Elopre, Kudroff, Westfall, Overton, & Mugavero, 2016; Snowden, Chen, McFarland, & Raymond, 2017). Early studies showed low interest in PrEP among MSM irrespective of race/ethnicity (King et al. 2014), yet as awareness of PrEP increases interest and uptake improves, specifically among older, educated, gay identified, White MSM (Goedel, Halkitis, Greene, Hickson & Duncan, 2016; Krakower et al. 2012). Studies examining PrEP interest and uptake in BMSM suggest a myriad of psychosocial and structural barriers (Eaton et al., 2017b; Garcia et al. 2016a; Ojikutu et al., 2018; Smith, Toledo, Smith, Adams, & Rothenberg, 2012). Yet, in qualitative research, traditional masculinity ideology has emerged as a consistent thematic barrier in HIV preventative behaviors among BMSM (Fields et al., 2012; Fields et al., 2015; Malebranche, Fields, Bryant & Harper, 2009; Murray, Gaul, Sutton & Nanin, 2018) including PrEP interest and uptake (Garcia et al. 2016a; Garcia et al., 2016b).

The Theory of gender and health (Courtenay, 2000) provides a framework for understanding why traditional masculinity ideology may influence PrEP interest among BMSM,

positing that engaging in health-related behaviors is an indication of femininity, while performing behaviors that place ones health at risk are instrumental in expressing masculinity (Courtenay, 2000). Thus, interest in and/or use of PrEP, a preventative health behavior, may be influenced by a desire to avoid being perceived as feminine among BMSM, as demonstrating masculinity is related to avoidance of several health-related behaviors among Black men (Campbell, Keefe, McKee, Waters, & Moul 2012; Hawkins et al., 2016; Liburd, Namageyo-Funa, & Jack, 2007). Further, because anti-femininity is central to traditional masculinity ideology and privileges heterosexuality, BMSM who endorse avoiding femininity may internalize the need to be perceived as heterosexual by others regardless of sexual orientation. Parent, Torrey, and Michaels (2012) found that among MSM frequency of HIV testing, an HIV preventive behavior linked to public perceptions of homosexuality, is related to conformity to the masculine gender role norm of heterosexual self-presentation. Specifically, MSM higher in heterosexual self-presentation are less likely to have previously tested for HIV. PrEP use may be perceived as linked to homosexuality as well, thus heterosexual self-presentation may pose as a similar barrier to PrEP engagement.

Further, since one's sexual orientation can be concealed, PrEP may pose a threat to the privacy of men who conceal their having sex with men, and to their already limited masculine capital (de Visser & McDonnell, 2013). Research has shown that efforts to conceal stigmatized identities (e.g., sexual minority status) are predictive of both negative psychological and health outcomes (Quinn, Weisz & Lawner, 2017), as well as increased engagement in risk behaviors (Quinn & Earnshaw, 2011). Thus, apprehensions of the perceived social stigma of using PrEP may deter interest among BMSM who endorse traditional masculinity ideology, yet who are prime candidates for its use. Previous studies have indicated avoidance of PrEP by BMSM due to

reported views that PrEP is for effeminate men (Garcia et al., 2016a; Ojikutu et al., 2018; Smith et al., 2012), suggesting that PrEP may be viewed as a prevention strategy specifically for gay men. Furthermore, within the gay community stigmatized beliefs regarding PrEP already exist (e.g., PrEP is party drug, or for promiscuous MSM "Truvada whores"; Schwartz & Grimm, 2017a,b). These presently held stigmatized beliefs may shape views among BMSM that PrEP is only used by gay men. Thus, BMSM who desire to avoid being labeled as gay may anticipate being stigmatized if found using PrEP[1].

The present study examined the role of traditional masculinity ideology in PrEP interest among BMSM. To our knowledge, this is the first study to assess the interactive influence of anti-femininity ideologies and stigma on PrEP interest. The goal was to examine how endorsement of avoidance of femininity and PrEP stigma influenced interest in PrEP uptake among BMSM. Specifically, we hypothesized that greater avoidance of femininity would relate to lowered PrEP interest in BMSM, that this relationship would be mediated by conformity to the gender norm heterosexual self-presentation, and that anticipation of experiencing sexual minority stigma through PrEP use would moderate this relationship both directly and indirectly. In addition, we controlled for potential covariates; participant age, outness, and frequency of HIV testing. Previous research has shown that age is positively associated with PrEP use among MSM (Krakower et al, 2012; Snowden, Chen, McFarland & Raymond, 2017), as well as negatively associated with awareness of PrEP among BMSM (Garnett, Hirsch-Moverman, Franks, Hayes-Larson, El-Sadr, & Mannheimer, 2018). Conceptually openness of sexual orientation should demonstrate a negative relationship to one's heterosexual self-presentation, as this gender role norms focuses on not being perceived as gay. Although one's gender

[1] See Appendix A for a detailed review of the present study rationale.

performance is not necessarily linked to sexual orientation, it is important to ensure that any effects found related to conforming to heterosexual self-presentation were independent of one's outness. Finally, HIV testing is an initial step in PrEP use, suggesting that BMSM who are regularly engaging in HIV testing may be more likely to report interest in PrEP. Thus, this variable was also controlled for to test the hypothesized relationship independent of its potential influence. Figure 1 shows the conceptual model tested[2].

Method

Participants and Setting

Participants were attendees of the 2017 Black Pride Festival in Atlanta, GA ranging in ages from 18 to 64 (M = 30.9, SD =9.88). The initial sample (N = 301) consisted of 226 men (75%) who identified as gay/same gender loving, 49 who identified as bisexual (16%), 12 who identified as heterosexual (4%), and 13 who identified their sexual orientation as other (4%). We excluded men who were HIV positive, as well as those who had not engaged in sex with another man in past 6 months, were currently using PrEP, or who reported a race/ethnicity other than Black. The final sample consisted of N = 123 sexually active, self-reported HIV-negative BMSM not currently using PrEP.

Measures

Demographic and health characteristics. Participants were asked their age, race/ethnicity, sexual orientation, income, and number of years of education completed. Participants reported the number of times they engaged in anal intercourse as the penetrative and/or receptive partner, with and without condoms in the past six months, and the number of

[2] Initially the current study was proposed with an additional construct, health care preferences, as a potential mediator. When included in the hypothesized model the construct did not produce significant results and was removed. However, the relationship regarding health care was incorporated into the final document. Results of the model with health care preferences included can be found in Appendix D.

male sexual partners whom they had engaged in each behavior. Frequency of previous HIV testing, and results of their most recent HIV test were assessed. Substance use was assessed regarding alcohol, marijuana, crack/cocaine, methamphetamine, and/or non-prescription drug over the previous six months. Alcohol use was measured further with the three-item consumption subscale of the Alcohol Use Disorders Identification Test (AUDIT-C; Maisto, Conigliaro, McNeil, Kraemer, & Kelley, 2000), which reflects frequency and quantity of alcohol consumption. Items were assessed on a 5-point scale (1 = *Never;* 5 = *Daily or almost daily*). Responses were averaged with higher scores indicating greater frequency and quantity of alcohol use. The consumption subscale demonstrated acceptable reliability (α = .76)

Openness of sexual orientation. Outness was assessed with two measures. First, participants reported on a 5-point scale (1 = *Not out at all;* 5 = *completely out*) the extent to which they were out about their sexual orientation. Participants also completed the Outness Inventory (OI; Mohr & Fassinger, 2000) an 11-item scale that assesses degree of outness ranging from 1 (person definitely does not know about your sexual orientation status) to 7 (person definitely knows about your sexual orientation status, and it is openly talked about). Responses were averaged across 10-items[3], with higher scores indicating a greater degree of outness. The OI demonstrated good reliability (α = .91).

Avoidance of femininity. The Male Role Norms Inventory-Short form (MRNI-SF; Levant, Hall & Rankin, 2013) assessed endorsement of avoidance of femininity. The avoidance of femininity subscale consists of three items, example item "Men should watch football games instead of soap operas". Responses were made on a 6-point scale (1 = *strongly disagree*, 6 =

[3] The OI consists of 11-items, ten of which form the three designated subscales. One item assessing openness to old heterosexual friends is not included in any of the subscales and may be used at the discretion of the researcher. For the present study this item was not included as a measure of outness.

strongly agree). Responses were averaged across items with higher scores indicating greater endorsement of avoidance of femininity, (α = .84).

Heterosexual self-presentation. The Conformity to Masculine Norms Inventory-46 (CMNI-46; Parent & Moradi, 2009) examined heterosexual self-presentation. The heterosexual self-presentation subscale contains six item that assess the importance placed on not being perceived by others as gay. Responses averaged across items indicate level of conformity to heterosexual self-presentation with higher scores indicating greater conformity, (α = .70).

PrEP stigma. To assess anticipated stigma regarding PrEP, five items were modified from the HIV Stigma Scale (Berger, Ferrans, & Lashley, 2001). Items were adapted to assess perceptions of how others would treat one if they used PrEP. An example item includes, "If I used PrEP, I would work hard to keep it a secret". An additional item was included, "If I used PrEP, people would automatically think I was gay". Responses were provided on a 4-point scale, (1 = *Strongly disagree*; 4 = *Strongly agree*)[4]. Averaged across items, higher scores indicated greater anticipated stigma of PrEP, (α = .86). To ensure only one aspect of stigma was measured an exploratory principal components factor analysis with varimax rotation was performed. Inspection of the scree plot, component matrix, and Eigenvalues indicated the only one factor could be extracted. An Eigenvalue of 3.80 accounted for 63.4% of variance.

PrEP Interest. Interest in PrEP was measured using a meaningful grouping composite variable (Song, Lin, Ward, & Fine, 2013), from three measures assessing PrEP interest. First, participants reported their level of interest in using PrEP on a rating scale, "How interested are you in taking PrEP?" on a 4-point scale (0 = *Not at all interested;* 3 = *very interested*). Next, the final page of the survey presented participants with the options to take either an informational brochure

[4] For analysis purposes scores were re-coded on a 0 – 3 scale.

regarding PrEP developed by the CDC (CDC, 2016b) and/or a list of local PrEP providers within the greater Atlanta metro area by answering either yes or no to each item.

CDC brochure. The CDC informational PrEP brochure (CDC, 2016b) provided information across several topics related to PrEP using including; what PrEP is, how it works, how to receive a prescription, as well as potential side effects.

List of local PrEP providers. To compile our list of local PrEP providers, three internet search engines were uses (e.g., Google, Bing, and Yahoo) to identify potential providers within the greater Atlanta metro area, resulting in twenty-eight listings. Next, each listing was contacted by phone to ensure the organization was operational and providing PrEP-related services (e.g., assistance to access PrEP or ability to prescribe on site). Nine of the locations either could not be contacted, or reported not providing any PrEP-related services. The final list consisted of 19 health centers providing PrEP-related services.

Prior to constructing the meaningful grouping composite variable of PrEP interest we conducted chi-square contingency tables to inspect the proposed relationships among indicators[5]. Significant associations occurred between the PrEP interest rating scale and taking a brochure, X^2 (3) = 10.43, p = .02, and between the rating scale and requesting a list of providers, X^2 (3) = 8.20, p = .04. As expected, the pattern found in the contingency tables suggested that taking a brochure related to a score of 2 on the self-report item while taking a list of local PrEP providers related to a score of 3. The behavioral measures were then recoded in parallel to the rating scale item; CDC brochure (0 = no, 2 = yes) and taking a provider list (0 = no, 3 = yes). Final scores of the composite measure of PrEP interest ranged from 0 (no interest in PrEP and not requesting either information source) to 8 (high interest in PrEP and requesting both sources of information).

[5] See Appendix B, tables B2 and B3 for Chi-square tables.

Procedure

Participant recruitment occurred at a public park in Atlanta, GA during the 2017 Black Pride festival. Males, who either approached our vendor tent, or were approached by a staff member as they walked through the event, were asked to complete a men's sexual health survey. Approximately seventy percent of those approached agreed to participate and complete the survey[6]. Prior to completing the survey, participants received an institutional review board (IRB) approved information sheet detailing the procedures, ensuring anonymity, and providing participants with contact information for research related questions or concerns. Participants were compensated $5 for their participation. Staff members collecting completed surveys provided compensation and any requested informational items. The University of Connecticut IRB approved all procedures.

Data Analysis

Descriptive analyses were conducted on socio-demographic characteristics using zero-order correlations and frequencies to describe the sample. A moderated mediation model tested the main study hypotheses. The model examined the influence of endorsement of avoidance of femininity on PrEP interest with conformity to heterosexual self-presentation as a mediator and PrEP stigma as a moderator using Hayes' PROCESS macro (model 15) in SPSS (Hayes, 2013). Hayes' model 15 allows for testing of moderated mediation and a test of conditional direct effects. Specifically, the model examined second stage moderation testing whether PrEP stigma moderated the second (b) path of the indirect effect, as well as the direct effect of avoidance of femininity on PrEP interest. Three covariates (participant age, the Outness Inventory and frequency of previous HIV testing) were included in the model. Probing for significance of

[6] A recruitment flow diagram can be found in Appendix B

conditional effects was performed at the 10th, 25th, 50th, 75th and 90th percentile; however, due to the limited range of the stigma scores in the present sample the 10th and 25th percentiles did not differ. Bootstrap samples for bias corrected bootstrap confidence intervals (CI) were set at 10,000. SPSS statistical software version 24 was used to conduct all statistical analysis[7].

Results

Socio-Demographic Characteristics

Participants reported an average of 14.6 (*SD* = 2.06) years of education, 2.45 (*SD*. =1.92) condomless anal intercourse acts in the past six months, and 2.36 (*SD* = 1.45) HIV tests over the past 12 months. Awareness of PrEP was high (88%; full sample 82%), and a plurality reported having considered using PrEP in the past (65%; full sample 56%), however previous PrEP use was low (5%; full sample 20%). The only substance reported used by a majority of the sample was alcohol (92%). However the mean AUDIT-C score across the sample was 1.55 (*SD* = .85), range [1, 4.33] suggesting frequency and quantity of alcohol use was low[8].

Bivariate Correlations and Model Constructs

Table 1 provides means, standard deviations, minimum and maximum scores and, zero-order correlations of the moderated mediation model variables. As expected, avoidance of femininity demonstrated significant positive relationships with heterosexual self-presentation (r = .45, p = .001), and PrEP stigma (r = .33, p = .001). Heterosexual self-presentation evidenced a significant negative relationship with the outness inventory (r = -.28, p = .002), and a significant positive relationship with PrEP stigma (r = .44, p = .001). Finally, frequency of HIV testing was significantly and positively correlated with interest in PrEP (r = .19, p = .04). This pattern of

[7] See Appendix C for a detailed explanation of the statistical equations for model 15.
[8] See Appendix B Table 3 for full demographic characteristics

associations partially supported the conceptual basis for our moderated mediation model; however, avoidance of femininity was not correlated with PrEP interest.

Moderated Mediation Analysis of PrEP Interest

Table 2 shows the results of the moderated mediation model. Results showed that our first hypothesis, that greater endorsement of avoidance of femininity would relate to lowered PrEP interest in BMSM, was supported. Higher avoidance of femininity related to lower interest in PrEP, b = -.95, SE = .37, p =.01, demonstrating that when holding heterosexual self-presentation constant, a one-unit increase on the avoidance of femininity subscale relates to a decreased interest in PrEP by almost one-unit. Our second hypothesis, that conformity to heterosexual self-presentation mediates the relationship between avoidance of femininity and PrEP interest was not supported in the hypothesized direction. Paths from avoidance of femininity to heterosexual self-presentation, b = .19, SE = .05, p < .001, and from heterosexual self-presentation to PrEP interest, b = 2.50, SE = .77, p = .002, were statistically significant indicating that when holding avoidance of femininity constant, a one-unit increase on the heterosexual self-presentation subscale relates to an increase in PrEP interest by two and a half units. Finally, PrEP stigma was found to moderate the effects of endorsement of avoidance of femininity and conformity to heterosexual self-presentation albeit not as predicted. The moderated direct effect of avoidance of femininity produced a significant positive interaction term on PrEP interest, b =1.61, SE = .46, p =.001. Probing the interaction showed this effect was strongest and significant for BMSM who reported moderate to higher levels of stigma (75th and 90th percentile), b = .66, SE = .32, p = .04 and b = .93, SE = .37, p = .01, respectively. Analyzing the interaction between PrEP stigma and heterosexual self-presentation on PrEP interest showed that the moderated effect on heterosexual self-presentation indicated an inverse relationship with

PrEP interest b = -2.48, SE = .99, p = .01, producing a negative moderated indirect effect (-.46, SE =.25) 95% CI [-1.12, -.09]. Examining the interaction at different levels of the moderator revealed that this effect was strongest and significant when stigma was low (50^{th} percentile), b = .31, SE = .15, 95% CI [.08, .65]. With respect to the covariates, HIV testing history was a significant covariate in the model. Age and outness however, did not significantly contribute to the model[9].

Discussion

The present study is the first that we are aware of to examine the interactive influence of masculinity ideology, specifically, avoiding femininity and conforming to heterosexual self-presentation, and anticipated PrEP stigma on PrEP interest. Results demonstrated two key findings. First and unexpectedly, heterosexual self-presentation positively mediated the relationship between avoiding femininity and PrEP interest. Second, anticipated PrEP stigma produced an inverse effect on both the direct relationship between endorsement of avoiding femininity and PrEP interest, as well as the mediated effect via conforming to heterosexual-self presentation. The relationships demonstrated in the present study suggest that expressing traditional masculinity ideology may lead to distancing from behaviors tied with femininity and homosexuality, such as a preventive health behavior in general and PrEP in particular. However, some aspects of masculinity such as presenting oneself as heterosexual socially may inhibit this relationship with respect to PrEP, possibly explaining the relationship found between internalized homophobia and PrEP use among BMSM (Eaton et al., 2017b). Interestingly, holding stigmatized beliefs regarding PrEP as a gay man's HIV prevention strategy may reverse, as opposed to enhance, these effects.

[9] SPSS PROCESS output of the moderated mediation model tested can be found in Appendix F.

Engaging in health care is often considered a feminine behavior (Courtenay, 2000). Therefore, men at the intersection of racial and sexual minority statuses may find it beneficial to their already limited masculine capital to avoid an HIV prevention method that requires active engagement in health care services. Thus, the negative relationship seen between avoiding femininity and PrEP interest may be explained as a means of avoiding behaviors that could violate proscriptions of traditional masculinity ideology as research has demonstrated such a relationship in Black men across other health-related behaviors (Campbell et al., 2012; Hawkins et al., 2017). Further, this finding quantitatively supports previous qualitative research that shows traditional masculinity ideology endorsing BMSM are less interested in PrEP as a prevention method (Garcia et al. 2016a,b; Ojikutu et al., 2018). The inconsistent mediation seen via heterosexual self-presentation in the relationship between avoidance of femininity and PrEP interest may help explain previous findings of the relationship between internalized homophobia, a construct closely related to anti-femininity (Kilmartin & Smiler, 2015), and PrEP use among BMSM (Eaton et al. 2017b). Greater adherence to gender roles is linked to greater internalized sexual stigma (e.g. internalized homophobia; Salvati, Pistella & Biaocco, 2017). Thus, the negative direct effect found between avoiding femininity and PrEP interest may be suppressed in masculinity endorsing BMSM who want to avoid being perceived as gay (e.g. possibly those on the "down low"). These men may view PrEP use as a behavior that is manageable, and less threating to maintain their masculinity than becoming infected with HIV, which may result in having to disclose their sexual minority status and potentially further reduce their masculine capital.

The moderation of the direct effect of avoidance of femininity by anticipated PrEP stigma on PrEP interest may be explained through an understanding of the role of identity salience in

persons with both visible (racial minority status) and concealable (sexual minority status) stigmatized identities. Individuals of sexual minority statuses typically learn negative stereotypes and beliefs regarding such statuses prior to becoming aware of the status in themselves, thus potentially internalizing those beliefs (see Quinn & Earnshawn, 2013). BMSM must contend with stigmatized views regarding their racial minority status and their sexual minority status both of which limit their masculine status. However, because one's race is not concealable, this identity may be more salient for BMSM. Research has also shown that some BMSM experience these identities in a public (racial minority) –private (sexual minority) dichotomy (Hunter, 2010). Thus, BMSM's sexual minority identity may become more salient through PrEP use. This heightened awareness may lead to anticipating that others will also become aware of their sexual minority status via PrEP use and may lead to experiences of internalized homophobia. As seen among heterosexually self-presenting BMSM, who may be experiencing internalized homophobia, fears of a loss of masculine capital through infection of HIV may produce greater interest in PrEP. However, although conformity to heterosexually self-presentation was found to be related to interest in PrEP, conforming to the norm while holding stigmatized beliefs regarding PrEP may diminish that relationship. That is, greater attention may be placed on how PrEP use will impact their lives, and how it may threaten exposure of a private identity that they feel they have been able to protect via other means of HIV protection.

The present study has several limitations. First, the cross-sectional design prevents the inference of any causal relationships. Second, because a convenience sample was used from a gay pride event, the sample may not be representative of BMSM. The sample does not likely include men who are most likely to endorse masculinity ideology or hold the stigmatized beliefs examined in the study. As the present study was conducted in one city within the southeastern

U.S., results may not generalize to BMSM in other geographical areas, specifically where traditional masculinity ideology may not have as strong an influence on the behavior of Black men (Levant & Richmond, 2007). Our results could have been influenced by the way interest in PrEP was measures. Behavioral and self-report measures may tap into different aspects of interest. Further, due to the stigma around PrEP the response to our behavioral measures may have been muted. Finally, although participants were informed of anonymity, social desirability may have influenced responses. Thus, sensitive behaviors may have been under reported. Future research should attempt to replicate the present relationships found among BMSM who are less connected to the gay community as research has shown these men are more likely to express less interest in PrEP (Garcia et al, 2016a).

Findings from this study provide a nuanced understanding of the influence PrEP stigma has on both avoidance of femininity and conformity to heterosexual self-presentation regarding PrEP interest. Messages promoting PrEP use should to be more inclusive of persons who are at high risk of HIV regardless of sexual orientation. This could serve in reducing the stigmatized beliefs held by some BMSM that PrEP is a clear indicator of homosexuality. Further, intervention research among BMSM should include critical consciousness components to transform gender norms. Such components, which have been shown to reduce negative influences of gender norms, have been effective in changing men's engagement in HIV-related behaviors such as improving uptake of HIV testing (Fleming, Colvin, Peacock, & Dworkin, 2016).

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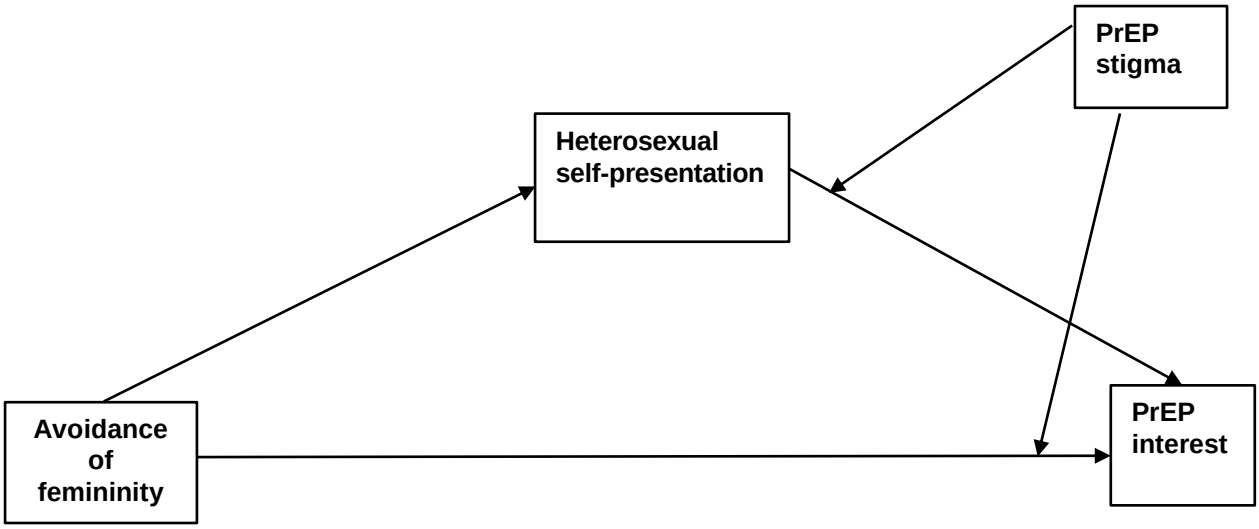

Figure 1. Conceptual moderated mediation model predicting PrEP interest.

Table 1. Correlations, means, and standard deviations of model constructs

Variable	PrEP	Avoidance of femininity	Heterosexual self-presentation	PrEP Stigma	Outness Inventory	Frequency of HIV testing
PrEP interest	1	.07	.15†	.17†	.11	.19*
Avoidance of femininity		1	.45**	.31**	-.17†	.04
Heterosexual self-presentation			1	.42**	-.28**	.06
Stigma				1	-.11	.01
Outness Inventory					1	.08
Frequency of HIV testing						1

Variable	Mean	S.D.	Min	Max
PrEP interest	3.02	2.76	.00	8
Avoidance of femininity	2.07	1.13	1	6
Heterosexual self-presentation	.89	.59	.00	2.33
PrEP Stigma	.57	.61	.00	2.33

Notes. † $p < .10$, * $p < .05$, ** $p < .01$. Min, Minimum score; Max, Maximum score.

Table 2. Moderated mediation analysis of PrEP interest among BMSM

Outcome: Heterosexual self-presentation					
Predictors	*b*	SE	t	LLCI	ULCI
(intercept)	.97	.25	3.80***	.46	1.47
Avoidance of femininity	.19	.05	4.01***	.09	.28
Age	-.01	.01	-1.13	-.02	.01
Outness Inventory	-.08	.03	-2.89**	-.13	-.02
Frequency of HIV testing	.02	.03	.73	-.04	.09
Outcome: PrEP interest					
Predictors	*b*	SE	t	LLCI	ULCI
(intercept)	1.43	1.43	1.00	-1.41	4.27
Heterosexual self-presentation	2.50	.78	3.21**	.95	4.04
Avoidance of femininity	-.95	.37	-2.58**	-1.69	-.22
PrEP stigma	-.90	1.13	-.79	-3.14	1.35
Heterosexual self-presentation x PrEP stigma	-2.56	1.01	-2.54**	-4.56	-.56
Avoidance of femininity x PrEP stigma	1.63	.46	3.51***	.71	2.55
Age	-.02	.03	-.57	-.08	.04
Outness Inventory	.20	.14	1.40	-.08	.47
Frequency of HIV testing	.40	.17	2.26*	.05	.74

Conditional direct effects of avoidance of femininity on PrEP interest						
Stigma (percentile)		*b*	SE	t	LLCI	ULCI
10th	.00	-.95	.37	-2.58**	-1.69	-.22
25th	.00	-.95	.37	-2.58**	-1.69	-.22
50th	.33	-.41	.28	-1.46	-.97	.15
75th	1.00	.67	.33	2.06*	.02	1.32
90th	1.17	.95	.38	2.49**	.19	1.70

Conditional indirect effects of avoidance of femininity on PrEP interest						
Stigma (percentile)			*b*	SE	LLCI	ULCI
Hetero	10th	.00	.47	.21	**.14**	**.99**
Hetero	25th	.00	.47	.21	**.14**	**.99**
Hetero	50th	.33	.31	.15	**.07**	**.66**
Hetero	75th	1.00	-.01	.16	-.33	.30
Hetero	90th	1.17	-.09	.19	-.50	.26

Index of moderated mediation				
	Index	SE	LLCI	ULCI
Heterosexual self-presenation	-.48	.26	**-1.17**	**-.08**

Notes. R^2 =.20, F (8,98) = 3.06, p = .01. $^{\dagger}p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$. *b*, unstandardized coffiecient; LLCI. Lower level confidence interval; ULCI, upper level confidence interval. Conditional indirect effect confidence intervals in bold do not encompass zero.

Appendix A: Rationale

Approximately 56% of people living with HIV/AIDS in the United States (U.S.) are men who have sex with men (MSM; CDC, 2016c). Although HIV incidence rates have stabilized since 2008, this stability has not held across all racial/ethnic groups. Such national trends mask sub-epidemics among certain racial groups of MSM. For example, compared to their White counterparts, who have experienced a decline in HIV incidence, rates among Black men who have sex with men (BMSM) steadily continue to rise. BMSM currently make up 58% of the Black/African American population living with HIV, and future CDC estimates suggest a sobering 1in 2 BMSM will become infected with HIV if current incidents rate continue (CDC, 2016a). The greatest hope for reducing HIV incidence is pre-exposure prophylaxis (PrEP), which relies on HIV negative persons taking antiretroviral therapy (ART). PrEP substantially reduces HIV transmission to nearly complete protection when taken daily (Baeten et al., 2012; Grant et al., 2010) and in the U.S. MSM are the main group targeted for PrEP use. Despite the demonstrated efficacy of PrEP, uptake has varied among MSM, with some research indicating particularly poor uptake among BMSM at high risk for HIV (Elopre, Kudroff, Westfall, Overton, & Mugavero, 2016; Snowden, Chen, McFarland, & Raymond, 2017). Early studies evinced low interest among MSM irrespective of race/ethnicity. For example, after the FDA's approval of PrEP in 2012, MSM presenting for HIV testing and counseling around San Diego, C.A. were educated on and offered a prescription for PrEP, yet, less than 1% of men expressed interest in, and accepted a prescription (King et al. 2014). However, other studies suggest that as awareness of PrEP increases uptake improves, specifically among older, educated, gay identified, White MSM (Goedel, Halkitis, Greene, Hickson & Duncan, 2016; Krakower et al. 2012) suggesting MSM who would benefit most from PrEP are still not being reached (i.e., BMSM). Studies

examining PrEP interest and uptake in BMSM suggest a myriad of psychosocial and structural barriers - HIV-related stigma, lack of health insurance/ affording care, adherence and side effect concerns (Ojikutu et al., 2018; Smith, Toledo, Smith, Adams, & Rothenberg, 2012), as well as medical mistrust/conspiracy beliefs (Eaton et al., 2017a; Garcia et al. 2016a). However, traditional masculinity ideology has emerged as a consistent thematic barrier in qualitative research examining HIV preventive behaviors among BMSM (Fields et al., 2012; Fields et al., 2015; Malebranche, Fields, Bryant & Harper, 2009; Murray, Gaul, Sutton & Nanin, 2018), and PrEP interest and uptake specifically (Garcia et al. 2016a; Garcia et al., 2016b). A previous study assessing gender performance in relation to HIV prevention in BMSM conducted by Garcia et al. (2016a) demonstrated that BMSM who endorsed traditional masculinity ideology viewed PrEP as a prevention method for effeminate BMSM or for men who more strongly identified as gay. Further, studies have shown that a lack of interest in PrEP is related to BMSM reporting that they would not want others to know they were using ART in fear that thy may be assumed HIV positive (Smith, Toledo, Smith, Adams, & Rothenberg, 2012). Thus, traditional masculinity ideology may play an important role in hindering PrEP use among BMSM.

Avoidance of Femininity and Heterosexual Self-Presentation

Traditional or "hegemonic" masculinity, defined as the dominant cultural construction of masculinity within a society, plays a major role in men's thoughts, beliefs, and behaviors. Within the U.S. traditional masculinity can only be possessed by being White, well educated, upper class, and heterosexual (Connell, 1995). While only an extremely small minority of men embody these criteria, men of excluded groups (e.g., racial and sexual minority men, and lower class Whites) use traditional ideals in their construction of masculinity as well. Indeed research has shown that traditional masculinity ideology is prevalent in many racial minority (Liburd et al.,

2007; Majors & Billson, 1992), and sexual minority communities (Kimmel, 1996; Taywaditep, 2001). Common among all of these constructions of masculinity is the desire to avoid associations with femininity.

Several theories of masculinity have pointed to anti-femininity as a highly influential and a central component of defining masculinity (Kilmartin & Smiler, 2015). Behaviors deemed feminine socially, including homosexuality, have to be avoided to demonstrate masculinity (Courtenay, 2000; Kilmartin & Smiler, 2015). Avoiding femininity is learned both directly and indirect through the socialization of boys early and throughout childhood (e.g., types of clothing, toy and chores assigned to boy), as well as through contextual social pressures that adult males experience in society (e.g., being competitive, successful, and/or inhibiting emotions other than anger). Further, because such concepts can be violated (boys playing with dolls or men showing weakness) and/or contested, there is a constant need for men to demonstrate their manhood (Courtenay, 2000; Kilmartin & Smiler, 2015). Cultural factors within minority groups may also influence conformity to masculine norms and the avoidance of feminine behaviors. For example, research shows that Black men typically score higher on measures of traditional masculinity compared to other racial/ethnic groups (see Hall & Applewhite, 2013) due to historical barriers specific to this group (e.g. disenfranchisement, segregation, racism; as cited in Ojikutu et al, 2018) relating to greater avoidance of femininity compared to other racial and ethnic groups. Thus, BMSM who strive to avoid subjugation of their manhood are able to do so by avoiding feminine behaviors, one of which includes engaging in general health-related behaviors. Lack of interest in and/or use of PrEP use, a preventative health behavior, may be influence by a desire to avoid feminine behaviors, which may explain the low interest seen among BMSM.

The Theory of Gender and Health provides a framework for understanding the potential relationship between avoiding femininity and interest in using PrEP, positing that health-related behaviors signal femininity, while engaging in behaviors that place health at risk are instrumental in expressing masculinity (Courtenay, 2000). BMSM who endorse anti-femininity ideals would therefore be less likely to exhibit interest in PrEP, which requires regular health care. Research has identified masculinity as an important factor in the lack of health care engagement among Black men (Cheatham, Barksdale, & Rogers, 2008), influencing engagement in many health-related behaviors in Black men (Campbell, Keefe, McKee, Waters, & Moul 2012; Hawkins et al., 2016; Liburd, Namageyo-Funa, & Jack, 2007). Because anti-femininity is at the center of traditional masculinity and privileges heterosexuality, BMSM who endorse avoiding femininity may internalize the need to be perceived as heterosexual by others regardless of sexual orientation. Parent, Torrey, and Michaels (2012) found that frequency of HIV testing among MSM, another HIV preventive behavior linked in public perceptions to homosexuality, is related to conformity to the masculine gender role norm of heterosexual self-presentation; MSM higher in heterosexual self-presentation were less likely to have previously tested for HIV. Because PrEP use may be perceived as linked to homosexuality, heterosexual self-presentation may pose a similar barrier to PrEP interest.

Anticipated Stigma of Being Outed by PrEP

For men who conceal their having sex with men, PrEP may pose a threat to their privacy. Efforts to conceal stigmatized identities are predictive of both negative psychological and health outcomes (Quinn, Weisz & Lawner, 2017) and increased engagement in risk behaviors (Quinn & Earnshaw, 2011). Some BMSM may endorse avoiding femininity (e.g., not engaging in positive health-related behaviors) as a means of concealing their sexual minority status in an effort to

maintain masculine capital (de Visser & McDonnell, 2013). Thus for those who are concerned with avoiding femininity, possibly through their heterosexual self-presentation, fears of being viewed as gay from PrEP use may further exacerbate the low interest in PrEP seen among BMSM. That is, apprehensions of the perceived social stigma of using PrEP may deter interest among BMSM who endorse traditional masculinity ideology yet who are prime candidates for its use. Previous studies have indicated avoidance of PrEP by BMSM due to reported views that PrEP is for effeminate men (Garcia et al., 2016a; Ojikutu et al., 2018; Smith et al., 2012), suggesting that PrEP may be viewed as a prevention strategy for only gay men. Furthermore, within the gay community stigmatized beliefs regarding PrEP already exist (e.g., PrEP is party drug, or for promiscuous MSM "Truvada whores"; Schwartz & Grimm, 2017a,b). These presently held stigmatized beliefs may shape views among BMSM that PrEP is only used by gay men. Thus, BMSM who desire to avoid being labeled as gay may anticipate being stigmatized if found using PrEP

Appendix B: Recruitment flow chart, demographic table, chi-square tables, and graphs

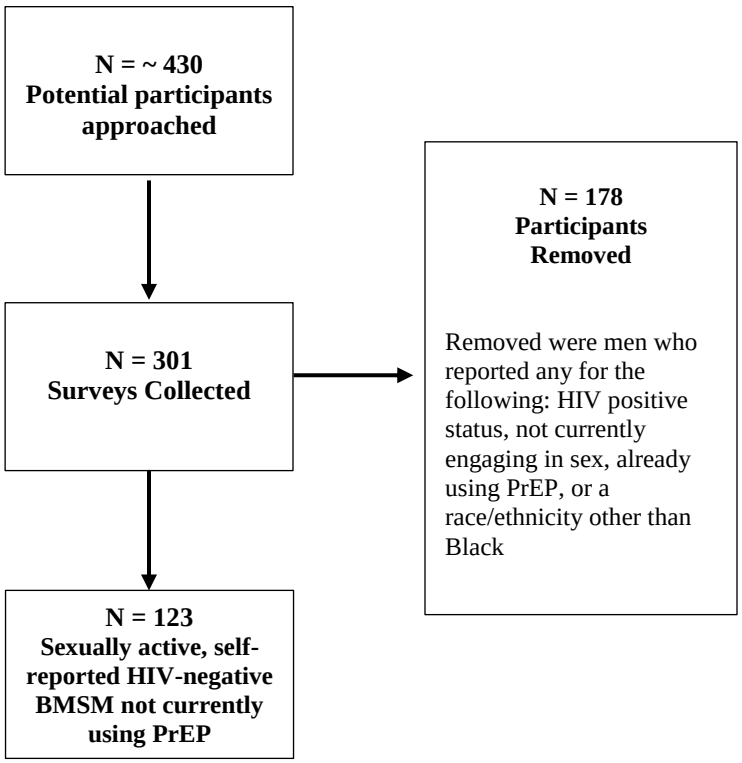

Figure B1. Participant recruitment flow diagram

Table B1. Socio-demographic characteristic

	N = 123			
Characteristic	*(n)*	%		
Income				
< 30,000	51	42		
≥ 30,000	71	58		
Employment				
Working	100	83		
Unemployed	8	7		
Student	13	10		
Sexual orientation				
Gay	87	71		
Bisexual	29	24		
Other	6	5		
Level of Outness				
Not out	6	5		
Out to some	50	41		
Completely out	65	54		
Relationship status				
Single	88	73		
Relationship	32	27		
Previously heard of PrEP	108	88		
Previously considered PrEP	79	65		
Taken PrEP in the Past	6	5		
Alcohol use	111	92		
Marijuana use	69	57		
Coke use	7	6		
Methamphetamine use	2	2		
Prescription drug use	4	3		
	M	s.d.	Min	Max
Age	29.0	8.23	19	63
Education	14.6	2.06	8	17
Outness Inventory	4.33	1.97	.42	7
Previous HIV testing	2.36	1.45	0	10
AUDIT-C	1.55	.85	1	4.33
CAI	2.45	1.92	1	14

Notes. AUDIT-C, Alcohol Use Disorders Identification Test; CAI, condomless Anal intercourse acts; Min, minimum score; Max, maximum score.

Table B2. Comparison of taking a CDC informational PrEP brochure to self-reported interest in PrEP

	Informational PrEP brochure		
Self-reported interest	Yes	No	Total
Not at all interested	4^{A}	24^{A}	28
Slightly interested	6^{A}	22^{A}	28
Interested	13^{A}	18^{A}	31
Very interested	14^{B}	15^{A}	29

Notes. X^2 (3) = 10.43, p = .02. ^{A,B} values with different superscripts differ significantly from each other at the p <0.05 level.

Table B3. Comparison of taking a list of local PrEP providers to self-reported interest in PrEP

	List of local PrEP providers		
Self-reported interest	Yes	No	Total
Not at all interested	5^{A}	23^{A}	28
Slightly interested	6^{A}	22^{A}	28
Interested	12^{A}	19^{A}	31
Very interested	14^{B}	15^{A}	29

Notes. X^2 (3) = 8.20, p = .04. ^{A,B} values with different superscripts differ significantly from each other at the p <0.05 level.

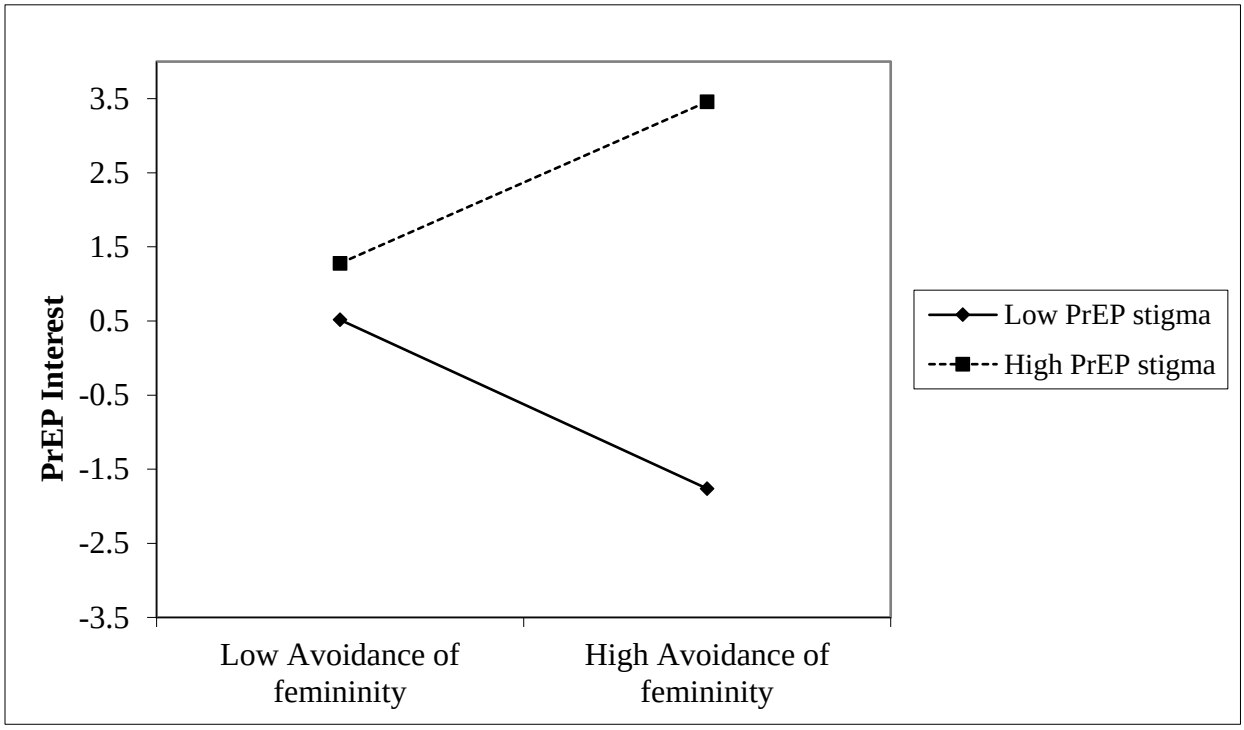

Figure B2. Interaction of avoidance of femininity and PrEP stigma.

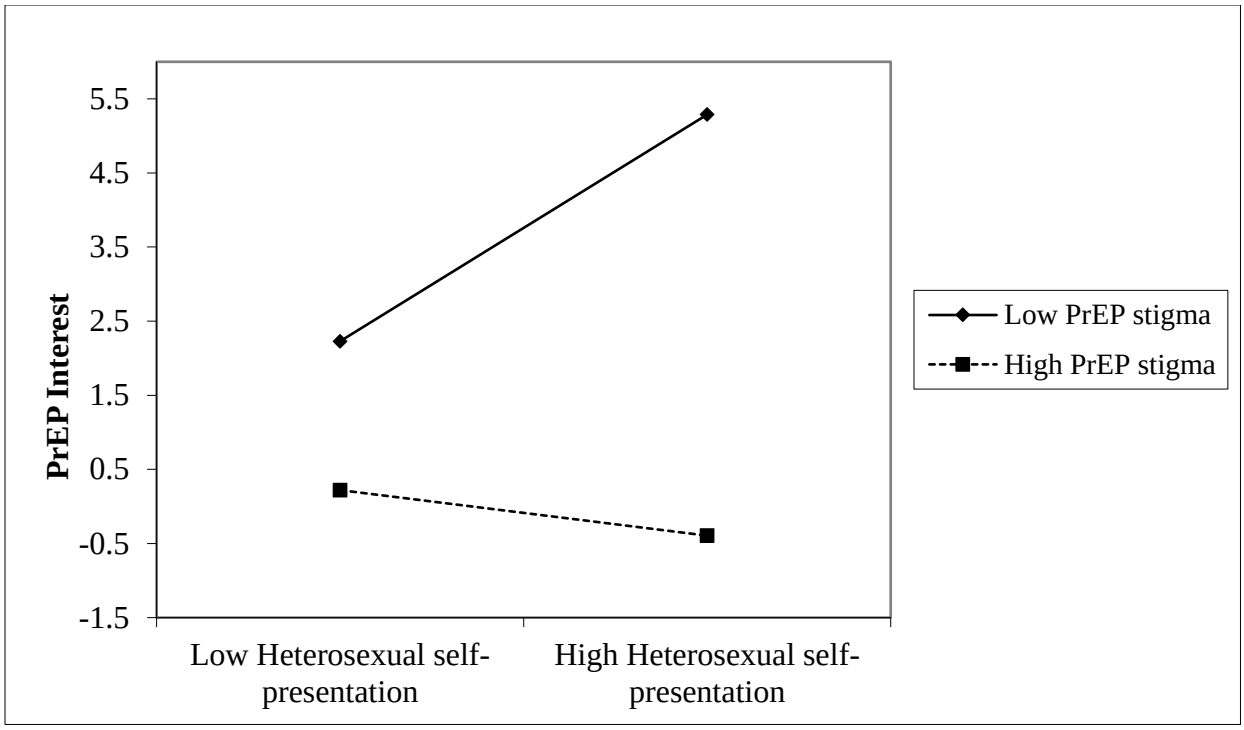

Figure B3. Interaction of heterosexual self-presentation and PrEP stigma.

Appendix C: Statistical Equations and Diagram of Model 15

In order to demonstrate moderated mediation, conditional indirect effects of a predictor variable via the mediator should differ at levels of the moderator (Hayes, 2013). Equations corresponding to the moderated mediation model of endorsement of avoidance of femininity, conformity to heterosexual self-presentation, and PrEP stigma, on PrEP interest in statistical form are

$$M_1 = i_1 + aX + e_M$$

$$Y = i_2 + c'_1 X + c'_2 V + c'_3 XV + b_{1M} + b_2 MV + e_Y$$

where M_1 represent the values of the mediator (heterosexual self-presentation), $i_{1,}$ is the intercept, a is the coefficient for the antecedent X (avoidance of femininity) and e_M is the error term in the M_1 equation. For the second equation, Y is the value of the outcome variable (PrEP interest), i_2 the intercept, V the moderator (PrEP stigma), c'_1 and c'_2 are the coefficients for the direct effects of X, and V respectively, and b_1 is the coefficients for the mediator, heterosexual self-presentation. Finally, c'_3 is the coefficients for the moderated direct effects of X, b_2 is the coefficients for the moderated antecedents M and e_y is the error term. With respect to the conceptual model initially proposed including medical care preference as a parallel mediator the equations corresponding to model in statistical form are

$$M_1 = i_1 + a_1 X + e_{M1}$$

$$M_2 = i_2 + a_2 X + e_{M2}$$

$$Y = i_3 + c'_1 X + c'_2 V + c'_3 XV + b_1 M + b_2 M + b_3 MV + b_4 MV + e_Y$$

where M_1 and M_2 represent the values of the mediators (heterosexual self-presentation and MCPS), $i_{1,}$ and $i_{2,}$ are the intercepts, a_1 and a_2 are the coefficients for the antecedent X (avoidance of femininity) and e_{M1} and e_{M2} are the error terms in each M equation. For the third equation Y is

the value of the outcome variable (PrEP interest), i_3 the intercept, V the moderator (PrEP stigma), c'_1 and c'_2 are the coefficients for the direct effects of X, and V respectively, b_1 and b_2 are the coefficients for the mediators, heterosexual self-presentation and MCPS respectively. Finally, c'_3 is the coefficients for the moderated direct effects of X, b_3 and b_4 are the coefficients for the moderated antecedents M_1 and M_2, and e_{y2} is the error term.

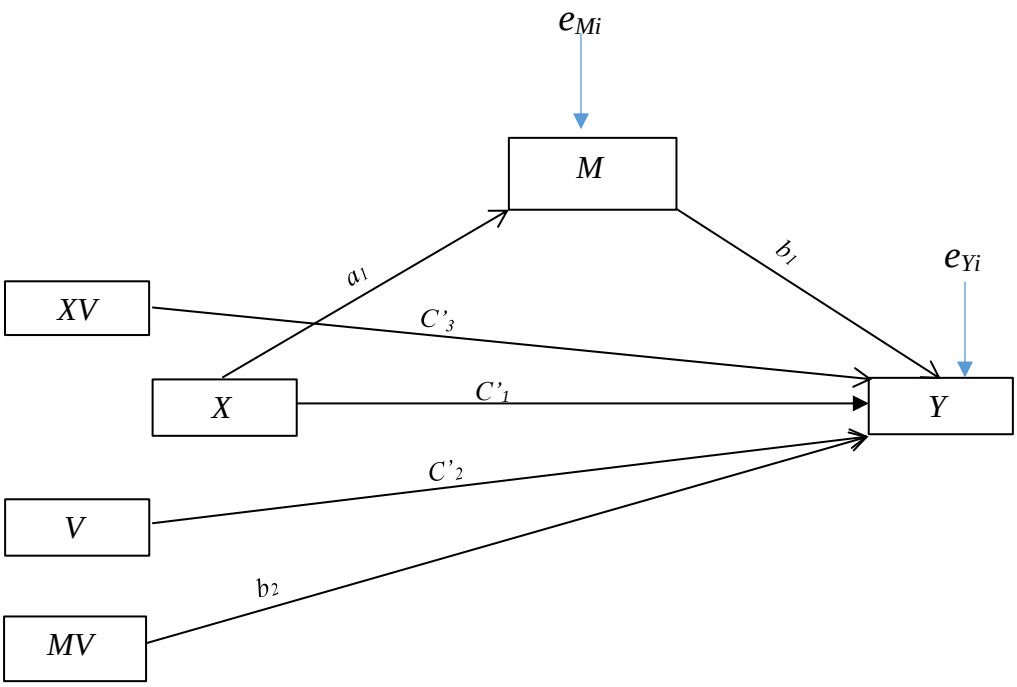

Figure C1. Statistical Diagram of Model 15 for the hypnotized conceptual moderated mediation model

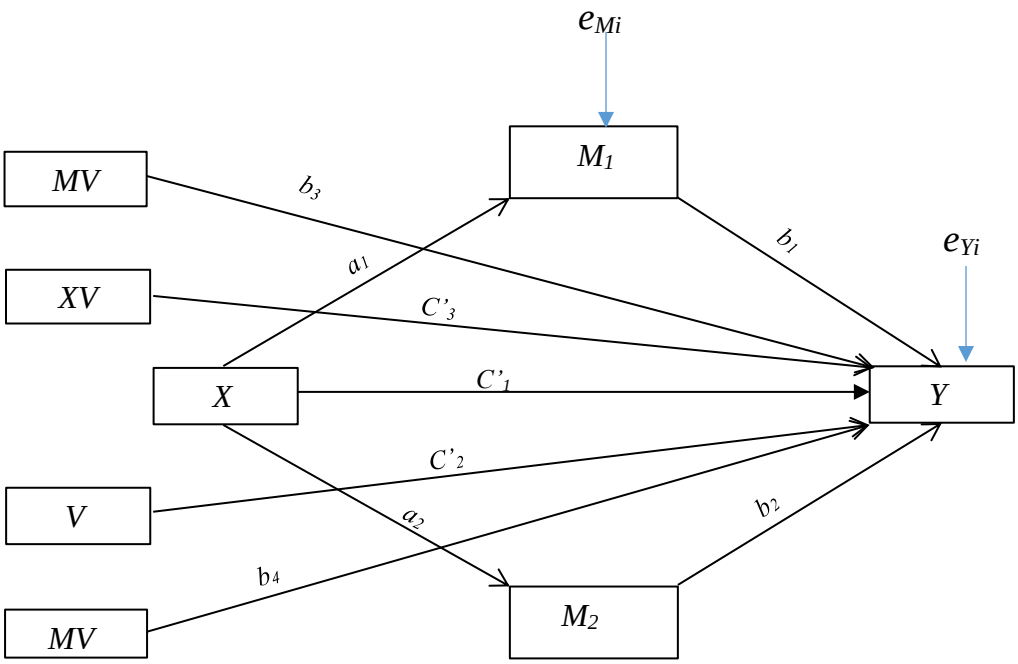

Figure C2. Statistical Diagram of Model 15 with two mediators in parallel

Appendix D: Medical Care Preferences as a Mediator

Below are analyses examining health care preferences as a parallel mediator, this construct was included in the initial thesis proposal.

Hypothesis 2b: The relationship found between avoidance of femininity and PrEP interest will be mediated by medical care preferences.

Measure.

Medical care preferences. Participants' health care utilization beliefs as medical care treatment preferences were assessed using the Medical Care Preference Scale (MCPS; Ganther, Wiederholt & Kreling, 2001). This 10 items scale measures patients' preferences for using medical care (e.g. physician services and prescription drugs) over self-care (e.g. home remedies). Responses were made on a 4 point scale (1 = *strongly disagree;* 4 = *strongly agree*). Responses were averaged with higher scores indicating a greater preference for seeking care from medical professionals versus self-treatments, demonstrated acceptable reliability (previous $\alpha = .78$).

Results

Bivariate Correlations and Model Constructs

Table D1 provides means, standard deviations, minimum and maximum scores and, zero-correlations for the model variables including the medical care preference scale. In addition to the reported relationships, the medical care preference scale evidenced a significant negative relationships with Heterosexual self-presentation ($r = -.22$, $p = .02$) suggesting that more heterosexual self-presentation was related to a lower preference for seeking medical care.

Moderated Mediation Analysis of PrEP Interest

Table D2 show the results of the moderated mediation model including medical care preferences. The first hypothesis, that greater avoidance of femininity would relate to lowered PrEP interest in BMSM, was supported. Higher avoidance of femininity related to lower interest in PrEP, $b = -.96$, SE = .38, $p = .01$, demonstrated that when holding both mediators constant, a

one-unit increase on the avoidance of femininity subscale relates to a decreased interest in PrEP by almost one-unit. Our second hypothesis, that conformity to heterosexual self-presentation and medical care preferences mediates the relationship between avoidance of femininity and PrEP interest in parallel was not supported. Paths from avoidance of femininity to heterosexual self-presentation, b = .19, SE = .05, p < .001, and from heterosexual self-presentation to PrEP interest, b = 2.52, SE = .81, p = .002, were statistically significant. This indicated that when holding avoidance of femininity and medical care preferences constant, a one-unit increase on the heterosexual self-presentation subscale relates to an increase in PrEP interest by a little over two and a half units. Paths from avoidance of medical care preferences, b = -.01, SE = .05, p = .81, and from medical care preferences to PrEP interest, b =.13, SE = .58, p =.83, were not statistically significant. Finally, PrEP stigma was found to only moderate the effects of endorsement of avoidance of femininity and conformity to heterosexual self-presentation albeit not as predicted. The moderated direct effect of avoidance of femininity produced a significant positive interaction term on PrEP interest, b =1.61, SE = .47, p =.001. Probing the interaction showed this effect was strongest and significant for BMSM who reported higher levels of stigma (90^{th} percentile), b = .92, SE = .38, p = .02. Analyzing the interaction between PrEP stigma and heterosexual self-presentation on PrEP interest showed that the moderated effect on heterosexual self-presentation indicated an inverse relationship with PrEP interest b = -2.67, SE = 1.04, p = .01, producing a negative moderated indirect effect (-.50, SE =.26) 95% CI [-1. 21, -.09]. Examining the interaction at different levels of the moderator revealed that this effect was strongest and significant when stigma was present (50^{th} percentile), b = .33, SE = .30, 95% CI [.07, .67]. With respect to the covariates, HIV testing history was a significant covariate in the model. Age and outness however, did not significantly contribute to the model.

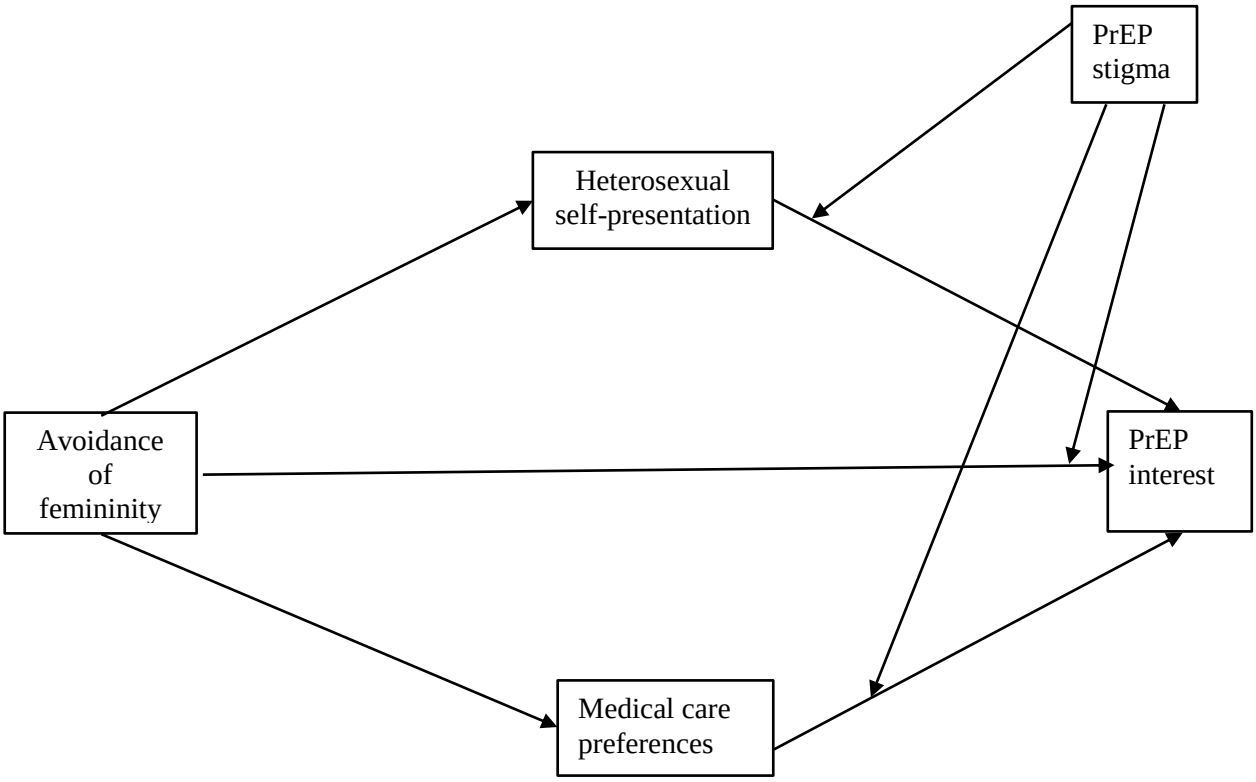

Figure D1. Conceptual moderated mediation model predicting PrEP interest.

Table D1. Correlations, means, and standard deviations

Variable	PrEP interest	Avoidance of femininity	Heterosexual self-presentation	Medical care preference	PrEP stigma	Outness Inventory	HIV testing
PrEP interest	1	.07	.15†	-.11	.17†	.11	.19*
Avoidance of femininity		1	.45**	-.03	.31**	-.17†	.04
Heterosexual self-presentation			1	-.22*	.42**	-.28**	.06
Medical care preference				1	-.14	.05	.11
PrEP stigma					1	-.11	.01
Outness Inventory						1	.08
HIV testing							1

Variable	Mean	S.D.	Min	Max
PrEP interest	3.02	2.76	.00	8
Avoidance of femininity	2.07	1.13	1	6
Heterosexual self-presentation	.89	.59	.00	2.33
Medical care preference	2.66	.56	1.30	4
PrEP stigma	.57	.61	.00	2.33

Notes. † $p < .10$, * $p < .05$, ** $p < .01$. Min, Minimum score; Max, Maximum score.

Table D2. Moderated mediation analysis of PrEP interest among BMSM

Outcome: Heterosexual self-presentation					
Predictors	*b*	SE	t	LLCI	ULCI
(intercept)	1.16	.24	4.84***	.68	1.63
Avoidance of femininity	.19	.05	4.01***	.09	.28
Age	-.01	.01	-1.13	-.02	.01
Outness Inventory	-.08	.03	-2.89**	-.13	-.02
Frequency of HIV testing	.02	.03	.73	-.04	.09
Outcome: Heterosexual Medical care preferences					
Predictors	*b*	SE	t	LLCI	ULCI
(intercept)	2.30	.26	8.74***	1.78	2.82
Avoidance of femininity	-.01	05	-.24	-.11	.09
Age	.01	.01	1.42	-.003	.02
Outness Inventory	.01	.03	.94	-.05	.07
Frequency of HIV testing	.04	.04	.30	-.04	.11
Outcome: PrEP interest					
Predictors	*b*	SE	t	LLCI	ULCI
(intercept)	.02	2.16	.01	-4.26	4.31
Heterosexual self-presentation	2.52	.81	3.09**	.90	4.14
Medical care preferences	.13	.58	.22	-1.03	1.28
Avoidance of femininity	-.96	.38	-2.53*	-1.72	-.21
PrEP stigma	2.55	3.17	.80	-3.75	8.85
Heterosexual self-presentation x PrEP stigma	-2.67	1.04	2.57**	-4.73	-.61
Medical care preferences x PrEP stigma	-.66	1.09	-.60	-2.83	1.51
Avoidance of femininity x PrEP stigma	1.61	.47	3.41***	.67	2.55
Age	-.02	.03	-.47	-.08	.05
Outness Inventory	.20	.14	1.38	-.08	.47
Frequency of HIV testing	.41	.18	2.30*	.05	.76

Conditional direct effects of avoidance of femininity on PrEP interest						
Stigma (percentile)		*b*	SE	t	LLCI	ULCI
10th	.00	-.96	.38	-2.53*	-1.72	-.21
25th	.00	-.96	.38	-2.53*	-1.72	-.21
50th	.33	-.42	.29	-1.47	-1.00	.15
75th	1.00	.65	.33	1.96†	-.01	1.31
90th	1.17	.92	.38	2.39*	.16	1.68

Conditional indirect effects of avoidance of femininity on PrEP interest						
	Stigma (percentile)		*b*	SE	LLCI	ULCI
Hetero	10th / 25th	.00	.47	.21	**.15**	**1.00**
Hetero	50th	.33	.30	.15	**.07**	**.67**
Hetero	75th	1.00	-.03	.16	-.37	.29
Hetero	90th	1.17	-.11	.20	-.54	.24
MCP	10th / 25th	.00	-.002	.04	-.11	.06
MCP	50th	.33	.001	.03	-.06	.08
MCP	75th	1.00	.01	.07	-.11	.22
MCP	90th	1.17	.01	.09	-.13	.26

Index of moderated mediation				
	Index	SE	LLCI	ULCI
Hetero	-.50	.26	**-1.21**	**-.09**
MCP	.01	.09	-.13	.27

Notes. R^2 =.20, F (10,96) = 2.44, p = .01. †p < .10. * p < .05. ** p < .01. *** p < .001. *b*, unstandardized coefficient; LLCI. Lower level confidence interval; ULCI, upper level confidence interval. Conditional indirect effect confidence intervals in bold do not encompass zero.

Appendix E: References
Below are references for works cited in the Appendices A, C, and D.

References

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Appendix F: PROCESS Statistical output from SPSS

Moderated mediation Analysis of avoidance of femininity, heterosexual self-presentation, PrEP stigma, and PrEP interest including covariates; age, frequency of previous HIV testing, and the Outness Inventory.

```
Run MATRIX procedure:

************* PROCESS Procedure for SPSS Release 2.16.3 *****************

          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2013). www.guilford.com/p/hayes3

**************************************************************************
Model = 15
    Y = Interest = PrEP interest composite variable
    X = AoFEM_X = avoidance of femininity
    M = HSP0_XX = heterosexual self-presentation
    V = STG_6 = PrEP stigma

Statistical Controls:
CONTROL= OI_X NumTest AGE = Outness Inventory, HIV testing, age respectively

Sample size
        107

**************************************************************************
Outcome: HSP0_XX

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .4898      .2399      .2675     8.0469     4.0000   102.0000      .0000

Model
              coeff         se          t          p       LLCI       ULCI
constant      .9687      .2549     3.8000      .0002      .4631     1.4743
AoFEM_X       .1869      .0466     4.0132      .0001      .0945      .2792
OI_X         -.0760      .0263    -2.8865      .0048     -.1283     -.0238
NumTest       .0247      .0340      .7252      .4700     -.0428      .0922
AGE          -.0070      .0062    -1.1279      .2620     -.0193      .0053

**************************************************************************
Outcome: Interest

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .4470      .1998     6.8916     3.0584     8.0000    98.0000      .0041

Model
              coeff         se          t          p       LLCI       ULCI
constant     1.4310     1.4306     1.0003      .3196    -1.4079     4.2699
HSP0_XX      2.4967      .7790     3.2050      .0018      .9508     4.0426
AoFEM_X      -.9546      .3699    -2.5805      .0113    -1.6886     -.2205
STG_6        -.8968     1.1320     -.7922      .4302    -3.1433     1.3497
int_1       -2.5588     1.0080    -2.5384      .0127    -4.5592     -.5584
```

```
int_2        1.6288      .4636     3.5137      .0007      .7089     2.5487
OI_X          .1950      .1392     1.4008      .1644     -.0812      .4712
NumTest       .3950      .1745     2.2639      .0258      .0488      .7413
AGE          -.0182      .0317     -.5718      .5688     -.0812      .0449

Product terms key:

 int_1    HSP0_XX     X     STG_6
 int_2    AoFEM_X     X     STG_6

******************** DIRECT AND INDIRECT EFFECTS *************************

Conditional direct effect(s) of X on Y at values of the moderator(s):
      STG_6     Effect         SE          t          p       LLCI       ULCI
      .0000     -.9546      .3699    -2.5805      .0113    -1.6886     -.2205
      .0000     -.9546      .3699    -2.5805      .0113    -1.6886     -.2205
      .3333     -.4116      .2814    -1.4630      .1467     -.9700      .1467
     1.0000      .6742      .3272     2.0604      .0420      .0249     1.3236
     1.1667      .9457      .3794     2.4930      .0143      .1929     1.6985

Conditional indirect effect(s) of X on Y at values of the moderator(s):

Mediator
             STG_6     Effect    Boot SE   BootLLCI   BootULCI
HSP0_XX      .0000      .4666      .2088      .1432      .9889
HSP0_XX      .0000      .4666      .2088      .1432      .9889
HSP0_XX      .3333      .3072      .1490      .0664      .6589
HSP0_XX     1.0000     -.0116      .1567     -.3329      .2955
HSP0_XX     1.1667     -.0913      .1858     -.4960      .2539

Values for quantitative moderators are 10th, 25th, 50th, 75th, and 90th
percentiles
Values for dichotomous moderators are the two values of the moderator.

******************** INDEX OF MODERATED MEDIATION ************************

Mediator
             Index   SE(Boot)   BootLLCI   BootULCI
HSP0_XX     -.4782      .2601    -1.1305     -.0690

******************** ANALYSIS NOTES AND WARNINGS *************************

Number of bootstrap samples for bias corrected bootstrap confidence
intervals:
    10000

Level of confidence for all confidence intervals in output:
    95.00

NOTE: Some cases were deleted due to missing data.  The number of such cases
was:
  16

------ END MATRIX -----
```

Appendix G: Men's Sexual Health Questionnaire

Health Survey

WE NEED YOUR HELP!

Fifteen Minutes of Your Time Can Help Improve Men's Sexual Health

Thanks for taking time to fill out this survey. Your help will provide important new information that will lead to better HIV education and prevention.

This survey is completely **anonymous**. Please do not put your name or any identifying information on this survey.

Please read all questions carefully. There are no right or wrong answers, just provide the answer that is true for you. By completing this survey, you give your consent to participate in this study and you may stop at any time without penalty.

Please do not put your name on this survey!

Please answer each question below.

1. What is your age? _____ years

2. What is your Zip code? _____

3. How would you describe yourself? (circle all that apply)

White Black Latino Asian Other_____

4. What is your gender identity?

Male Female Trans Female Trans Male Other_____

5. How many years of school have you completed?

6 7 8 9 10 11 12 13 14 15 16 17+

6. Which is closest to your current yearly income?

$0 - $15,000 $16 - 30,000 $31 - $45,000 $46 - $60, 000 $61-75,000 Over $75,000

7. What is your current employment status?

Working Unemployed Student Receiving Disability Other

8. Which of the following best describes your current relationship status?

I'm not having sexual relations	Having sex but do not have an exclusive partner	I'm in a relationship and I/we have outside partners	In an exclusive relationship with one person (no outside sexual partners)

9. What is your current marital status?

Not married Married to a man Married to a woman

10. Which best describes your sexual orientation?

Gay Bisexual Heterosexual Other _____

11. How “out” are you about your sexual orientation?

Not “out” about sexual orientation	“Out” to a few close friends but not family or others (e.g. work or school)	“Out” to close friends and family but not others (e.g. work or school)	Completely “Out” about sexual orientation

Use the following rating scale to indicate how open you are about your sexual orientation to the people listed below. Try to respond to all of the items, but leave items blank if they do not apply to you. If an item refers to a group of people (e.g., work peers), then indicate how out you generally are to that group.

---

1 = person definitely does NOT know about your sexual orientation status
2 = person might know about your sexual orientation status, but it is NEVER talked about
3 = person probably knows about your sexual orientation status, but it is NEVER talked about
4 = person probably knows about your sexual orientation status, but it is RARELY talked about
5 = person definitely knows about your sexual orientation status, but it is RARELY talked about
6 = person definitely knows about your sexual orientation status, and it is SOMETIMES talked about
7 = person definitely knows about your sexual orientation status, and it is OPENLY talked about
0 = not applicable to your situation; there is no such person or group of people in your life

---

1. Mother	1	2	3	4	5	6	7	0
2. Father	1	2	3	4	5	6	7	0
3. Siblings (brothers/Sisters)	1	2	3	4	5	6	7	0
4. Extended family/ Relatives	1	2	3	4	5	6	7	0

5. My new heterosexual friends	1	2	3	4	5	6	7	0
6. My work peers	1	2	3	4	5	6	7	0
7. My work Supervisor	1	2	3	4	5	6	7	0
8. Members of my religious community	1	2	3	4	5	6	7	0
9. Leaders of my religious Community	1	2	3	4	5	6	7	0
10. Strangers, new acquaintances	1	2	3	4	5	6	7	0
11. My old heterosexual friends	1	2	3	4	5	6	7	0

Please answer these next questions to the best of your knowledge.

---

1. Have you ever been tested for HIV? YES NO

2. If you have been tested, do you know the results of your most recent HIV test?

HIV Positive HIV Negative Don't Know I have not been tested

3. If you have been tested, how many times have you been tested in the past 12 months?
(Please write a number) _____ Number times tested (ever)

4. If you have been tested for HIV,
what month & year did you last get tested? _____ _____
It's okay if you're not certain of the exact date, month year
just give us your best guess.

5. Do you plan to get tested in the next year? YES NO

6. When you see a health care provider, are you open
about your sexual orientation? YES NO

7. Has a health care provider talked with you about sexual health in the past year? YES NO

8. Has a health care provider talked with you about PrEP? YES NO

9. Would you be comfortable bringing up PrEP to a health care provider? YES NO

PrEP (pre-exposure prophylaxis) is when an HIV-negative person takes anti-HIV medications, also known as antiretrovirals and more specifically Truvada", <u>BEFORE HAVING</u> <u>SEX</u> to prevent HIV infection. The following sections ask about PrEP.

---

1. I am HIV positive, PrEP does not apply to me. YES NO

2. Have you previously heard about PrEP? YES NO

3. Have you ever thought about taking PrEP in the past? YES NO

4. Are you currently taking PrEP? YES NO

5. Have you ever taken PrEP in the past? YES NO

6. How interested are you in taking PrEP currently?

Not at all interested	Slightly interested	Interested	Very interested

7. What is your current interest level, given as a percent, in getting a prescription for PrEP? _____ (e.g. ranging from 0% - 100%)

Please answer the following five (5) questions ONLY if you are HIV positive.

---

1. Are you currently receiving medication for HIV? (e.g., antiretroviral therapy) YES NO NOT SURE N/A

2. Do you know your current HIV viral load? YES NO NOT SURE N/A

3. Do you know your current CD4 count? YES NO NOT SURE N/A

4. Would you encourage an HIV negative partner to use PrEP? YES NO NOT SURE N/A

5. How often do you take your HIV medication per month?

Rarely/Never	A few days in a month	Most days in a month	Everyday	N/A

The following are beliefs that people may have about using PrEP. Please circle your answer to show how much you agree or disagree with each.

	Strongly Disagree	Disagree	Agree	Strongly Agree
1. If I used PrEP no one would date or become involved with me.	1	2	3	4
2. If I used PrEP, I'd worry about people discriminating against me.	1	2	3	4
3. If I used PrEP, people would automatically think I was gay.	1	2	3	4
4. If I used PrEP, I would work hard to keep it a secret.	1	2	3	4
5. If I used PrEP, I would feel set apart and isolated for the rest of the world.	1	2	3	4
6. I would feel I were not as good as others if I used PrEP.	1	2	3	4
7. I would feel ashamed for using PrEP.	1	2	3	4

All Items of the Conformity to Masculine Norms Inventory-46 Items Redacted By Request of Authors.

Please circle your answer to show how much you agree or disagree with each.

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1. Men should watch football games instead of soap operas.	1	2	3	4	5	6
2. A man should prefer watching action movies to reading romantic novels.	1	2	3	4	5	6
3. Men should always like to have sex.	1	2	3	4	5	6
4. Boys should prefer to play with trucks rather than dolls.	1	2	3	4	5	6
5. A man should not turn down sex.	1	2	3	4	5	6
6. A man should never admit when others hurt his feelings.	1	2	3	4	5	6
7. Men should be detached in emotionally charge situations.	1	2	3	4	5	6
8. It is important for a man to take risks, even if he might get hurt.	1	2	3	4	5	6
9. A man should always be ready for sex.	1	2	3	4	5	6
10. When the going gets tough, men should get tough.	1	2	3	4	5	6
11. I think a young man should try to be physically tough, even if he's not big.	1	2	3	4	5	6
12. Men should not be too quick to tell others that they care about them.	1	2	3	4	5	6

Thinking about your own actions, feelings and beliefs, please indicate the response that best represents you by circling the number to the right of the statement that matches your response. You should give the responses that most accurately describe your general tendencies. It is best you respond with your first impression when answering.

	Strongly Agree	Agree	Disagree	Strongly Disagree
1. For most health problems, I would rather treat myself than go to the doctor.	1	2	3	4
2. For most health problems, I prefer to avoid taking prescription drugs.	1	2	3	4
3. I usually like to talk to a doctor when I have a health problem.	1	2	3	4
4. For most health problems, I wait and see if I get better on my own before going to see a doctor. .	1	2	3	4
5. For most health problems, I wait and see if I get better on my own before taking a prescription drugs. .	1	2	3	4
6. When I have a health problem, I often prefer to use home remedies instead of prescription drugs. .	1	2	3	4
7. When I have a health problem, I usually contact a doctor right away.	1	2	3	4
8. For most health problems, I would rather take a prescription drug than a nonprescription drug.	1	2	3	4
9. When I have a health problem, it is sometimes hard to convince me to see a doctor.	1	2	3	4
10. I prefer to treat most health problems without help from doctors or prescription drugs.	1	2	3	4

Please circle how much you have used the following in the past 6 months of this year.

	None	At least Once or twice	Several times	Every week
1. Alcohol	0	1	2	3
2. Marijuana	0	1	2	3
3. Cocaine/Crack	0	1	2	3
4. Methamphetamine/ Crystal/Crank/ Tina	0	1	2	3
5. MDMA/Molly/Ecstasy	0	1	2	3
6. Nitrates (poppers)	0	1	2	3
7. Other recreational drug	0	1	2	3

Please answer the following questions about your use of alcohol.

1. How often do you have a drink containing alcohol?

Never	Monthly or less	2-4 times a month	2-3 times a week	More than 4 times a week

2. How many drinks containing alcohol do you have on a typical day when you are drinking?

0, I do not drink	1 or 2	3 or 4	5 or 6	7 to 9	10 or more

3. How often do you have 6 or more drinks on one occasion?

Never	Less than monthly	Monthly	Weekly	Daily or almost daily

Please think carefully about the past 6 months of this year, and fill in the spaces below. Please be sure to write a number in every space. If you did not do a behavior, write a zero (0) in the space. Give your best estimate of how many times you have done the following things:

1. How many men have you had sex with in the past 6 months? _____Total number of men in past 6 months

2. How many times have you had each type of sex AND with how many different men in the past 6 months…..

Anal sex, **no condom** used, my partner inserted his penis in me (I was bottom). _____ Times past 6 months

_____ Number of men past 6 months

Anal sex, **no condom** used, I inserted my penis in my partner (I was top). _____ Times past 6 months

_____ Number of men past 6 months

Anal sex, **condom used**, my partner inserted his penis in me (I was bottom). _____ Times past 6 months

_____ Number of men past 6 months

Anal sex, **condom used**, I inserted my penis in my partner (I was top). _____ Times past 6 months

_____ Number of men past 6 months

3. What sexual position do you consider yourself?

Top Versatile top Versatile Versatile bottom Bottom Oral only

Please answer the following questions ONLY if you are HIV negative.

1. Would you like an informational brochure regarding PrEP?

YES **NO**

2. Would you like a list of local PrEP providers?

YES **NO**

Thank you for taking time to complete this survey.